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JULIE BILLINGSLEY  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES



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## TITLE

Method of manufacture to create a flat fronted viewing panel with at least a portion of the other side of the panel being non-flat, this side having a masking layer applied to at least a portion of the surface such that the pattern & ornamentation of the non-flat surface can be viewed through clear body of the viewing panel to create a viewing window for viewing through the device.

## DESCRIPTION

This invention relates to a method for manufacturing a generally flat fronted, clear bodied viewing panel with at least a portion of the other side of the panel being non-flat, this side having a masking layer applied to at least a portion of the surface such that the pattern & ornamentation of the non-flat surface can be viewed through clear body of the viewing panel to create a viewing window for viewing through the device.

Display items and especially photographs are often displayed in display devices such as photo frames. To effectively present a display item such as a photograph most photo frames consist of the frame (often wood or metal), a clear protective viewing panel (often glass), a separate backing board, and several clips to hold all the components and the photograph together.

In addition to these components a mount is often added, to be placed between the clear protective viewing panel and the photo, the mount is used to enhance the "look" and ornamentation of the frame and photo. The mount is usually a flat panel (often made of paper or cardboard) with a central viewing portion in its centre. The photo that is on display is viewed through this central viewing portion. The mount can be plain or it can have a pattern applied to its surface to further enhance the "look" of the photo.

The inclusion of a mount within a photo frame has its draw backs, the mount comprises an additional component that needs to be held in place within the framing device, along with the photo and the clear protective viewing panel. In addition the mount is often made of thick cardboard so that when its central viewing portion is cut, there is created a further framing effect around the photo. The application of the this framing effect does not need to be limited to the border of the viewing portion, further ornamentation, often in the form of additional grooving, can be applied across the surface of the entire mount. The main problem with a thick mount is that increases the width and therefore the size (and materials needed to be used) for the frame required to hold the photo, the protective viewing panel, the backing board & the mount.

Another problem with the use of a mount is that over time they tend to warp and buckle, becoming unsightly and no longer an improvement to the "look" and ornamentation of the photo and frame. They cannot easily be straightened but rather more often need to be replaced. Moisture in the atmosphere, that does not affect the clear protective viewing panel (often glass), will affect the mount, especially if it is made of thick cardboard. Expensive mounts can be purchased to resist moisture, but this is no guarantee that they will not warp and distort over time. Changes in temperature, over night and day, will cause the mount to expand & contract, often at a rate that is different to the material of the frame & the protective viewing panel, this can cause the mount to become buckled & warped overtime. Irrespective of the material there will always be a gap between the mount and the cover panel that over time moisture and mould can penetrate into, this becomes

unsightly and difficult to clean, requiring the dismantling of the framing device. Further if the mount has ornamentation applied across its surface such as grooves that can become very difficult to clean. The problems of cleaning the mount are compounded if the mount has a 3-D pattern applied to or cut into its surface, these grooves and other surface irregularities can have mould and dust accumulate in them. A flat surface can be quickly wiped clean, a 3-D grooved surface cannot, rather the mould and dust must be gouged out with a fine instrument, where upon this can easily damage the mount.

These cleaning complications are also applicable if the frame itself has anything else but a simple profile, the more ornate the more dust it can collect and the harder it becomes to clean.

Yet another problem with the use of mounts is that the surface of the mount can become dirty over time, because the mount is a separate component its surfaces are exposed to the elements of the environment, even though it is placed behind the clear protective viewing panel it is a separate component that is exposed to the atmosphere and over time mould and dust can be deposited onto the surface of the mount, as this is behind the clear protective panel it is unsightly and can be very difficult to clean. To clean the mount would require the complete dismantling of the display device

With current methods of manufacturer at least four separate components are required to be able to produce photo frame with a mount, 1 the frame, 2 the clear protective viewing panel, 3 the mount, 4 the backing panel and the clip system. Further more a non-flat texture applied to the front outer surface of the framing device can accumulate dust & grime and become difficult and time consuming to clean.

The object of this invention is to provide method of manufacture to produce a

flat fronted viewing panel with at least a portion of the other side of the panel being non-flat, this side having a masking layer applied to at least a portion of the surface such that the pattern & ornamentation of the non-flat surface can be viewed through clear body of the viewing panel to create a viewing window for viewing through the device,

a generally flat display device cover sheet viewing panel with a mask and ornamentation (3-D effect),

single piece, generally flat fronted display device cover sheet that provides a clear protective viewing panel, with a masking element on the rear surface

a display device that eliminates the need to have a separate mount in a photo frame and that can have ornamentation (in 3-D) applied to its rear surface that is sealed from the atmosphere and does not require any cleaning to remove dust & grime that may accumulate over time and eliminates any possibility of damage during cleaning.

C1 Method of Manufacture to create display panel with a clear body, a generally flat front surface, an rear surface with an non-flat portion and a central viewing section, a mask applied to the rear surface leaving at least a central viewing section, the mask being seen through the clear body panel and the masking highlighting the non-flat section of the rear of the panel, the mask enhancing the ornamentation effect of the non-flat rear surface, the mark also being able to hide from view and retention components of the display device.

C 2 The steps involved in producing such a device are

- 1 start with a clear flat panel.
  - 2 apply a protective layer to one or both sides.
  - 3 define a central viewing section, or sections, by cutting this from the protective layer on the rear surface of the panel.
  - 4 Create the non-flat section of the rear panel, this can for example be done by engraving a pattern onto the rear surface of the panel around the central viewing section.
  - 5 Apply the masking to the rear surface, this can be done for example by powder coating or spray painting.
  - 6 Once the masking is affixed to the rear surface remove the protective layer that remains on the rear surface to expose the central viewing section.
- Additionally or alternatively steps 4 & 5 can be repeated to further enhance the level of ornamentation achieved by having a non-flat rear surface. Multiple profiles and patterns can be created on the rear surface, different coloured masks can be applied to highlight the different patterns. For example after step 3 a masking agent can be applied in one colour(step 5), after this a pattern can be engrave in the rear surface(step 4), removing some of the masking as it is created, but leaving that colour masking over the rest of the surface, now another masking layer can be applied in a different colour can be applied (step 5 repeated). This process can be repeated a number of times.
- Additionally or alternatively the protective layer around the central viewing portion can be either removed before Step 4 the creation of the non-flat section of the rear surface of the panel, or it can be left to be removed before Step 5 the application of the masking.

TO assist with understanding the invention reference will now be made to the accompanying drawings. Illustration is by way of example only,

- FIG 1 generally flat panel with a protective layer applied to its surface  
FIG 2 the protective layer cut to define the central viewing portion of the panel  
FIG 3 cross section showing protective layer left over the central viewing section  
FIG 4 cross section showing creation of non-flat portion on the rear of the panel  
FIG 5 cross section showing application of the masking to the rear surface  
FIG 6 removal of protective film from viewing section  
FIG 7 cross section showing paint filling grooves but leaving central viewing portion  
FIG 8 cross section showing creation a non flat section after masking has been applied  
FIG 9 Examples of cross sections of different profiles on non-flat section on rear surface  
FIG 10 Example with Two Viewing Panels  
FIG 11 Panel with 4 attachment elements on the rear surface.

The following legend applies to the accompanying figures.

- 1 - Clear Body Panel
- 2 - Protective Layer
- 3 - Non-Flat Rear Surface
- 4 - Masking
- 5 - Engraving through masking layer
- 6 - Differing Profiles of Non-Flat Rear Surface
- 7 - Attachment Elements on Rear Surface

To produce such a device a clear generally flat panel is used, it can be any such material so long as a non-flat section can be created upon or into one surface. A preferred material is plastic or glass. Another option is to have a clear panel injection moulded with a flat front and a non-flat rear surface.

To one side of the panel, the side that will become the rear surface when used in a display device (to be known as the rear of the panel) a protective film is applied. The protective film may also be applied to the other side, front side, of the panel to provide protection during the manufacturing process. The protective film is not required to be attached permanently. The protective film is required to be removable. The protective film is required to be able to be cut, while remaining attached to the panel surface. The protective film is required to be able to be removed easily from the panel surface, as required. The protective film can be any material such that it is able to remain attached to the surface of the panel during the stages of the manufacturing process. A preferred material for the protective film is paper with a removable adhesive on its surface to allow for releasable engagement with surface of the panel. Another preferred material is plastic. Some sections of the protective film may be required to remain attached to the surface of the panel during the entire manufacturing process whilst being easily removable at the end of the manufacturing process.

Upon the rear side of the panel that has the protective film applied, an area of the panel that is to become the viewing portion is to be determined, this would usually be within the centre of the panel, but it can be created anywhere or on a number of sections of the panel. Once defined this area is created by cutting its required shape into the protective film, the cut must be of sufficient force and accuracy such that it cuts through the protective film while leaving the panel underneath intact. The objective of the cut is to separate the protective film into sections; a section of the protective film covering what will become the clear viewing portion or portions of the panel, and a section of the protective film covering what will be removed for the application of the masking. The area of protective film that covers the central viewing section is required to remain attached during the application of the masking.

If a pre moulded clear panel is used, only a protective film over the viewing section needs then be applied before the masking is applied, there is no need to apply a protective film over the entire panel. It is easier to apply the protective layer to a flat surface than a non-flat surface.

With the protective film on the rear surface now divided into distinct areas the non flat section on the rear surface of the panel can be created. The protective film that covers the viewing section must be left on, but the section that covers the masking area may be removed before the non flat section is created, this is not necessary as it can be removed after the non flat section of the rear surface has been created. If the cut that defined the viewing section has cut the protective film correctly the surrounding protective film can be quickly and easily removed from the panels surface.

A non flat portion of the rear surface of the panel needs to be created (a 3-D texture is created on the rear of the panel), this created upon the areas outside those of the central viewing portion. The non-flat surface (or texture) can be created in a number of ways, these can include but a not limited to engraving, etching, scoring, sand blasting, moulding, melting, grinding, drilling, chemicals, heat and pressure stamping. The protective film that covers the central viewing section is required to remain attached during this process of creating the non-flat section of the rear surface without inhibiting the application of the

texture. If the protective film has been left upon the rear surface, covering the masking area where the 3-D texture is to be applied, it is required to not inhibit the application of the 3-D texture. For example to engrave a 3-D texture onto the surface of the masking section the protective film can be removed before the engraving is begun, if the protective film is to be left on it must not inhibit the creation of the engraving and the 3-D effect. For example if the 3-D effect is being created by the process of engraving the protective film needs to remain attached to surface except where the engraving tool is engraving into the surface of the panel. The decision to remove or leave the protective film on will depend on the type of effect being applied, the intricacy of the design and how much of the masking area will be affected by the design. For a simple design it would be easier to leave the protective film on. For more complex designs it may be better to remove the protective film before starting to create the textured 3-D effect.

Once the non flat section (3-D texture) has been created the masking layer, surrounding the central viewing portion and covering 3-D texture must be created. It is this masking layer, on the rear surface, when viewed from the front through the clear body panel, that creates a visual appeal and distinction of the frame, it allows the non-flat section to be clearly seen thorough the clear body. The more reflective the masking the apparent the the texture will appear. With the central viewing portion remaining covered by protective film the remainder of the rear surface of the panel, including the textured area, is cleared of any remaining protective film. Once all the excess protective film is removed a mask is applied to the rear surface. The protective film over the central viewing section protects its from the masking, the rest of the panel, any uncovered areas will be masked. The masking agent creates a border around the central viewing portion and fills in and covers the 3-D texture, protecting it and enabling it to be viewed through the clear body panel. By having the central viewing section covered by its section of protective film the mask can be applied quickly, in volume, over the entire rear surface of the panel. There is no need to worry about the mask hitting the area that has been defined as the viewing section because it is still covered by its section of protective film. The mask attaches and bonds to the rear surface of the panel and any non-flat section (3-D texture) that has been created. Any masking that hits the protective film cover the viewing section will bond to the protective film, not the panel and is quickly & easily removed when the protective film is removed.

The masking can be applied in a variety of different forms including powder, fluids, paint, electrostatic adherence etc. A preferred method is the application of paint by spray. The important step is that the surface of the panel & the surfaces of the 3-D texture are all covered. Liquid paint is a preferred material as it is fluid and as such can be easily applied to a flat surface & an irregular 3-D surface. The application of a fluid as the mask is that it applies easily to non-flat surfaces and when dry encloses and protects the surface that it is covering. In this case and texture is sealed from the atmosphere.

Once the mask is applied and has cured enough to be handled, the remaining section of protective film, that covers the central viewing portion of the display panel can be removed. This produces the clear central viewing portion of the display device.

The resulting flat panel can be used as a panel, with a sealed masking element, for a display device, it has a flat front surface, a clear central viewing section, a surrounding masking section and a non-flat (3-D texture) on the rear surface that can be viewed through the clear body of the panel, the device is simple to use because it comprises a single piece (not three sperate components; a clear panel, a mount & a textured frame), that has an easy to clean flat front surface and a texture applied to its rear surface that

never has to be cleaned of accumulated dust and grime because the indents are sealed from the environment and atmosphere by the masking applied to the rear surface, the masking is viewed from the front through the clear panel. The viewed surface of the mask cannot accumulate mould or get dirty because it is applied directly to the rear surface of the panel. The device, used in a traditional frame requires one less component (not protective panel & mount). The device allows for a thinner framing unit as there is the need for one less component. It is easier to produce non standard shapes.

The steps of applying a mask to the rear surface & to apply a non-flat texture to the rear surface can be interchanged and or repeated to create a number of different textures and profiles on the rear surface and or a number of different coloured masks on the rear surface

The abovementioned illustrations outline , by way of example, a few of the possible embodiments of such an invention, many different versions are possible within the scope of this invention. One possible version is the creation of a single one piece frame by pacing separate attachment elements to the rear surface of the panel. For example 4 separate magnets can be applied to the rear surface to produce a one piece magnetic photo frame. Such a panel can also be placed inside a traditional photo frame to enhance its look and to do away with the need for a mount. The above techniques can be applied to produce a number of different panels, specifically the use of engraving can be used to create different patterns on the display panel and to put logos and captions on the panels.

DR.Monopoly is claimed in the shape and or configuration of a photo frame/display device as shown in the accompanying representations.

The visual appearance is created with a clear body panel having a generally flat front surface and a least a portion of the rear surface being non-flat (as represented by "3-D" in the illustration), the rear surface having a masking layer applied to at least a portion of it. The masking layer on the rear surface is viewed from the front through the clear body panel.

No limitation is claimed for the shape of the clear body panel.

No limitation is claimed for the shape or position of the viewing portion of the photo frame/display device.

No limitation is claimed for the shape or depth of profile of the non-flat rear surface of the clear body panel.

No limitation is claimed for the pattern or ornamentation of the non-flat rear surface of the clear body panel when viewed from the front (one possibility is represented by "3-D" in the illustration, other possibilities include specific words, logos, ornamentation and patterns).

No limitation is claimed for the width of the respective borders, created by the masking layer around the central viewing section or the subsequent position of the viewing section of the body panel.

No limitation is claimed for the colour or combination of colours of the masking.

No limitation is claimed for the level of reflectivity of the masking.

No limitation is claimed for the shape, position or number of separate elements on the rear surface of the body panel (as represented by four separate rectangles on the rear surface of the body panel in the illustration).

FIG 1

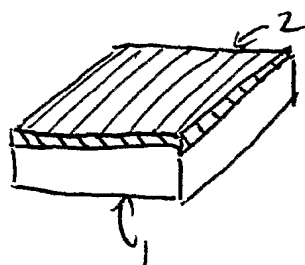


FIG 2

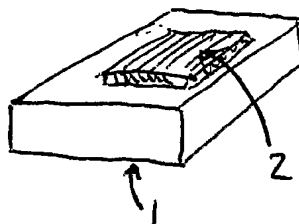


FIG 3

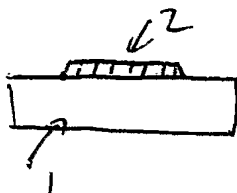


FIG 4

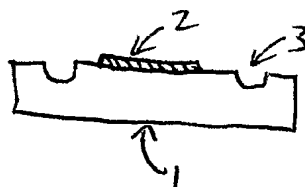


FIG 5

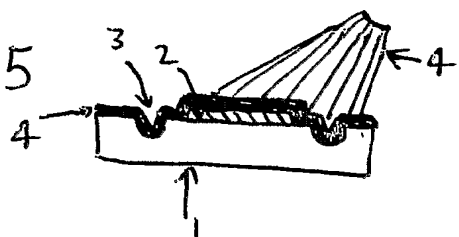


FIG 6

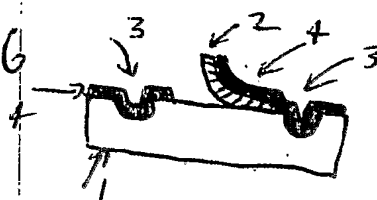


FIG 7

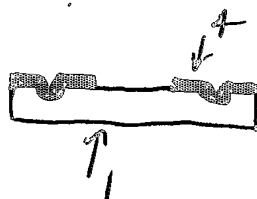


FIG 8

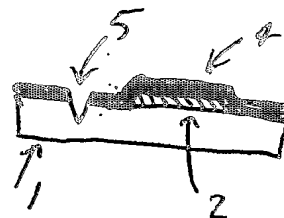


FIG 9

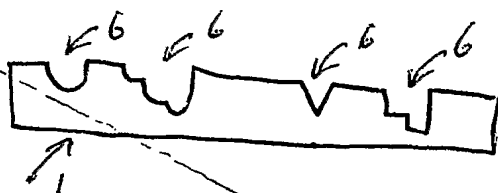


FIG 10

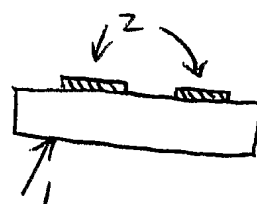


FIG 11

